



UK Research
and Innovation

North America
Amérique du Nord

UKRI in North America: Impact in a changing world



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Foreword

Dame Ottoline Leyser

CEO of UKRI



I am delighted to introduce *UKRI in North America: Impact in a Changing World*, a report celebrating fifteen years of shared success since UKRI, then in the form of RCUK, established an office in Washington, DC in 2008.

The breadth and scale of UK partnership with North America has played a vital role in advancing institutional and individual research and innovation, from foundational partnerships to transatlantic careers. Since 2015, UKRI has funded around 3000 awards involving collaboration with North America, with over £3bn of investment which has opened doors to new knowledge and leveraged funding from outside the UK. UKRI has a crucial role to play in ensuring these valuable connections and collaborations can flourish.

The UKRI North America Office developed the first MoU on Research Cooperation with the US National Science Foundation in 2013. This MoU created the underpinning conditions for increasing collaboration between the two agencies, including our Lead Agency opportunities, with their simpler application process enabling hundreds of talented researchers to collaborate on cutting-edge fundamental research.

UKRI continues to engage across all disciplines and sectors in outstanding programmes with North American partners. Our activities range from a longstanding collaboration on

the Ecology and Evolution of Infectious Diseases, especially pertinent given the COVID-19 pandemic, to creating the conditions for future connections and emerging research areas such as International Summer Schools on quantum technologies.

We continue to scale-up our strategic engagement in global challenge areas, supporting UK government priorities. We recently joined US and Canadian partners in two major multilateral initiatives on clean energy and climate change, with a total of ~£25m UK investment, alongside an additional ~£60m from North American partners.

The UKRI North America Office, with staff based in Washington, DC, and Ottawa, plays a pivotal role in catalysing and connecting to ensure our partnerships deliver ever-increasing impact. This report spends time with UKRI's most trusted partners and – often in their own words – tells a story of an ever-strengthening relationship which contributes to UKRI's aim to Transform Tomorrow Together.



“ Since 2015, UKRI has funded around **3000 awards** involving collaboration with North America, with over **£3bn of investment** which has opened doors to new knowledge and leveraged funding from outside the UK.

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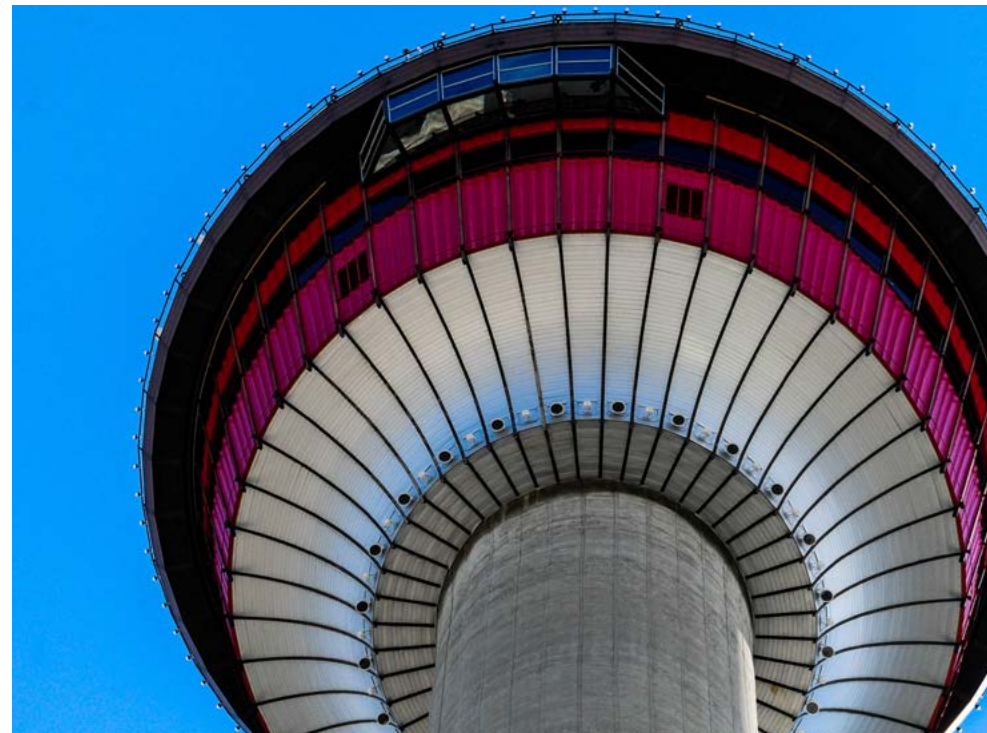
1.

Introduction

The UK Research and Innovation (UKRI) North America Office (UKRI NA Office) serves as UKRI's voice in the US and Canada, establishing a dialogue between funders and policy makers and facilitating new research partnerships. The impact assessment will act as a baseline and signpost for UKRI's future collaborative trajectory with North America.

1.1. Scope of the report

In 2023 the UKRI NA Office will be 15 years in operation. This report presents findings from a series of 20 in-depth interviews with stakeholders from across the UK, the US and Canada, desk-based research and analysis of data on programme level investment and individual project awards. It documents the evolution and impact of the UKRI NA Office over its 15-year existence, demonstrating the successful relationships with key stakeholders and partnerships that have been nurtured. The impact assessment highlights the significant and increasing mutual value that the UK's research collaboration with North America generates.



2.

Fifteen Years of UKRI in North America

The United Kingdom has a long history of research collaboration with both the US and Canada, stretching back to research cooperation on issues of defence, energy, and aviation in the 1940s.

Over the past 15 years the frequency and depth of UK-US/Canada collaboration has increased substantively. Since Research Councils UK (RCUK), UKRI's predecessor, established its US Office at the British Embassy in Washington a series of ground-breaking frameworks and agreements have provided a foundation for stronger, trusted research relationships between the UK, the US and Canada.



2.

Often drawing on UKRI NA Office networks, to date there have been around 100 collaborative research programmes supporting an abundance of research awards worth hundreds of millions of pounds, providing UK and US researchers with funding to address shared priorities across a vast range of research topics (Figure 2.1).

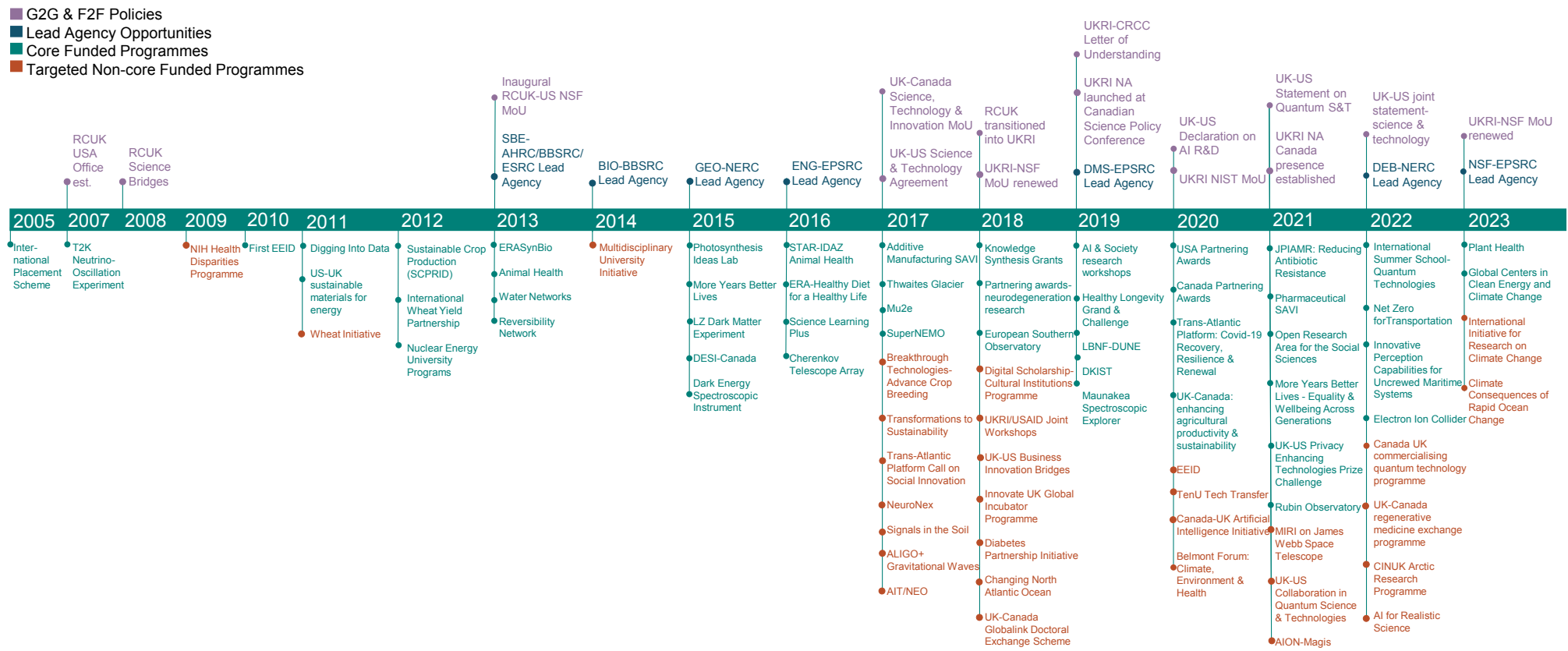


Figure 2.1
Source: UKRI NA Office Programme Data

2.

The growth in transatlantic research has been a product of both daily interaction between the UKRI NA Office, US and Canadian funding agencies and UKRI Research Councils, and a series of significant milestones that have expanded the coverage of research and innovation activity and simplified the processes surrounding UK-US/Canada collaborative research. Some of the often-cited milestones referred to by study contributors include:

- A Memorandum of Understanding (MoU) with the US National Science Foundation in 2013 which paved the way for new, streamlined UK-US funding application processes (referred to as Lead Agency) first utilised by the US National Science Foundation's (NSF) Social, Behavioral and Economic Sciences (SBE) Directorate and the Economic and Social Research Council (ESRC), Arts and Humanities Research Council (AHRC) and the Biotechnology and Biological Sciences Research Council (BBSRC) in the UK. Lead Agency opportunities have since been expanded to cover other councils and directorates, and more than 200 UK-US collaborative research projects have been supported through the new, streamlined processes since they were first established.
- The UK-Canada Science, Technology and Innovation MoU, signed in 2017 between Global Affairs Canada and the UK's then Department for Business, Energy, and Industrial Strategy (BEIS), which aimed to enhance cooperation between UK and Canadian government bodies, knowledge-based institutions, and research and innovation clusters in all areas of research, technology, entrepreneurship and innovation. Since 2017 there has been a notable increase in the volume and value of joint UK-Canada research projects, and by 2021 the UKRI NA Office had employed dedicated personnel within a new Canada presence in Ottawa to continue building the collaborative research base.
- Collaboration between the UK and US on world-class science and innovation was also strengthened in 2017 by the UK-US Science and Technology Agreement.
- Renewal of the UKRI-NSF MoU in 2018 following the then RCUK transition to UKRI and reflecting significant expansion of the scale and scope of collaborative research activity in preceding years.
- UKRI NA Office-facilitated development and signing of the UKRI-CRCC (Canada Research Coordinating Committee) Letter of Understanding in 2019 which clearly signalled UKRI's intentions to explore expanded research cooperation with Canada. Later that year, the UKRI North America Office expanded to Canada, as well as the US, and was formally launched at the Canadian Science Policy Conference.
- More recently, the UK and US signed a declaration on Cooperation in Artificial Intelligence Research and Development in 2020, and a joint statement on cooperation in quantum information sciences and technologies in 2021. Subsequently, the UKRI NA Office has led dialogue on new collaborative research opportunities, including an expansion of Lead Agency opportunities which will enable UK-US bottom-up collaboration in quantum and AI.
- At the time of writing, research relationships between the UK, the US and Canada are recognised as being very strong, streamlined funding mechanisms between the UK and the US now span almost every possible research area supported by UKRI and NSF, and the UKRI-NSF MoU will be renewed for a second time, providing new opportunities to build upon increasingly important transatlantic research relationships.

3.

Stimulating more transatlantic research activity

The breadth of UK-US/Canada research activity is vast, involving numerous different networks, funding mechanisms and actors on both sides. The UKRI NA Office is one relatively small yet hugely significant part of that landscape. This section presents findings from quantitative and qualitative research regarding the overall trend in UK-US/Canada research activity, the drivers of those trends, and the role that the UKRI NA Office has played in catalysing, convening and progressing collaboration.

“ [The UKRI NA Office] catalyses and connects. Making use of being in the Embassy and the High Commission to connect with government colleagues. Making sure that we are identifying synergies and mutual priorities.

UKRI Representative

3.

3.1. Overarching trend in UK-US/Canada research activity

Since the UKRI NA Office was established, there has been a steady and substantive increase in the volume and value of transatlantic research activity. Most recent data on joint UK-US/Canada research awards clearly demonstrates the upward trend in the volume of collaboration between UK and US/Canadian researchers.

Since 2015 (Figure 3.1) UKRI has invested over £3bn via 2,797 awards involving North American collaborators. Between 2015 and 2022 the volume of awards has increased by 30% and the value of awards has increased by 66%. Within the overall upward trend in both volume and value of awards, there have also been fluctuations in the value of UK-US/Canada research awards in 2017 and 2019. This fluctuation is driven by a number of different factors, for example linked to the commencement of substantive multi-year programmes.

Since 2020, there has been a steady increase in the value of research awards provided by UKRI to UK-US/Canadian research projects, indicative of growing demand for, and increasing need to effectively facilitate, collaboration between UK and US/Canadian researchers.

Over the past 15 years, the UKRI NA Office has enabled collaborations with over 50 funding partners across the US and Canada, and by extension to hundreds of US and UK universities. This network includes but is not limited to Federal Government departments, funding agencies, research institutes and laboratories with hundreds of millions of dollars (US and Canadian) in annual budgets and hundreds of thousands of employees. A complete list of US and Canadian funding partners referenced within UKRI programme data is available in Appendix 2. By working closely with these funding partners, the UKRI NA Office connects the scientific community across North America and the UK, acting as a catalyst for further transatlantic research collaboration. Through its focus on the priorities of each funding partner, the UKRI NA Office has earned the trust of US and Canadian funders and research organisations, positioning UKRI as a partner of choice.

Since 2015, UKRI has invested over £3bn across 2,797 awards in North America.

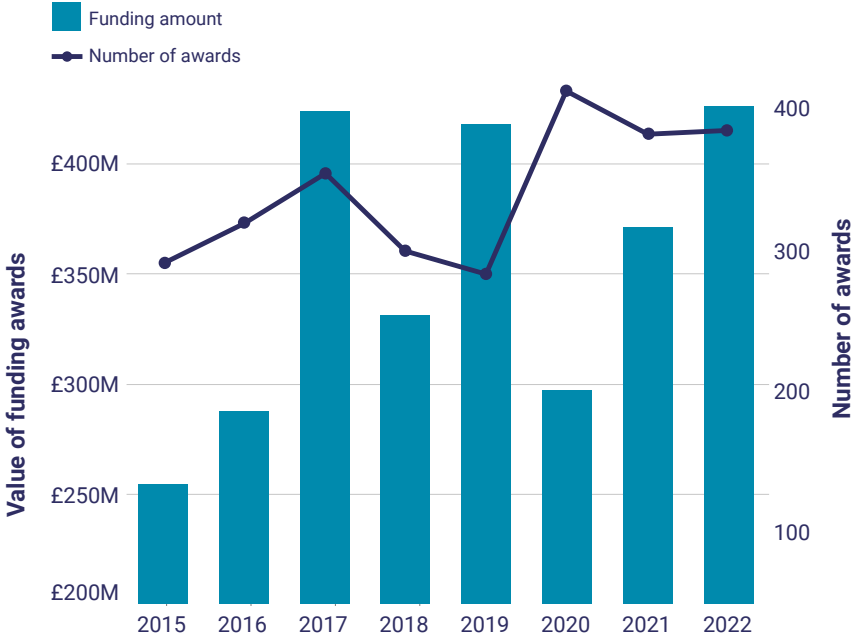


Figure 3.1: UKRI Research Grants Involving US/Canadian Collaborators

Source: UKRI DataHub

1 Note that these grants include funding from across the seven UKRI Research Councils (and Research Councils UK prior to UKRI transition) and are based on projects involving a staff member (the principal or co-investigator) or project partner based at a US/Canadian organisation. Data does not include Innovate UK awards or infrastructure investments.

3.

3.2. Drivers of increasing UK-US/Canada research activity

Findings from qualitative research emphasised how the drivers of increasing transatlantic research activity are multifaceted, including macro issues such as the changing geopolitical environment and increasing recognition of the value of trusted research partnerships. However, they are also recognised as including much more directly influenceable micro-level factors such as:

- Significant and long-term investment of time and resources in creating new streamlined, flexible and responsive models for transatlantic research, through a combination of core funding, the Lead Agency mechanism (described in more detail below) and additional hypothecated funding streams.
- The physical presence of the UKRI NA Office and the highly valued benefits that it brings, including deep networks in both North America and the UK, and equally deep understanding of the research landscape and funding mechanisms across jurisdictions.
- The deep networks and knowledge of the UKRI NA Office enables rapid response to additional, non-core funding opportunities at scale.

“ [The UKRI NA Office] makes it easier to get things done... they play this key role in bringing people and [funding opportunities] and conversations together.

US Funding Partner

“ They’re boots on the ground, [they] know the system. If they’re here, they have a much better understanding of what we had, and what we’re up against.

US Funding Partner



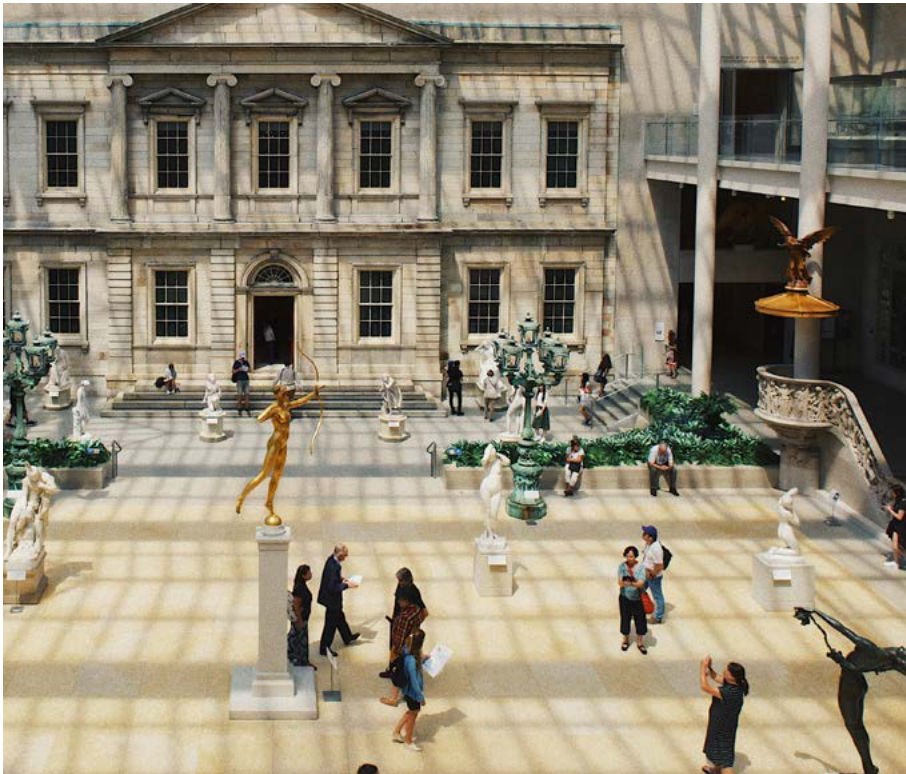
“ My feeling is that the UKRI North America Office is like a critical liaison point, they are a critical connect point between NSF and UKRI - the ability to be here in person, and to be able to make those in person connections and build personal relationships, I think that is really important.

US Funding Partner

3.

3.3. Creating new streamlined, flexible and responsive collaboration models

In the 15 years since the office was established, consecutive teams have maintained a clear and consistent focus on improving the efficiency and effectiveness of models for transatlantic research collaboration. By building and maintaining expertise in funder operations, and strong relationships on both sides of the Atlantic, the office has helped to create and embed new, more streamlined models for research collaboration, and has leveraged knowledge and expertise to respond quickly and at scale to new funding opportunities. The sub-sections below describe some of the more significant transatlantic research models that the UKRI NA Office has helped to create and leverage.



3.3.1. Establishing Lead Agency

Lead Agency opportunities provide a framework for joint international research proposals to go through a single funding agency’s peer review process. One organisation takes the lead in managing the review process with an agreed level of participation by the other, and both agencies agree the outcome of the review process and fund the costs of the successful applications in their respective countries. The Lead Agency mechanism simplifies the process by which researchers can apply for bilateral research funding.

Lead Agency opportunities are now a well-recognised model for effective bottom-up international research collaboration across UKRI Research Councils and in several international jurisdictions. The first Lead Agency opportunity between UK and US funders was facilitated by the RCUK US Office in 2013 between the US NSF and RCUK meaning that, for the first time, researchers applying for funding in the social, behavioural and economic sciences would now benefit from a single application process, facilitating more research on both sides of the Atlantic.

“ Lead Agency is interesting because we don’t do agreements where we allow the other agency to handle the review very often. With UKRI that is really helped in the sense that their review process is trustworthy to us and vice versa.

US Funding Partner

“ I think the real reason why the Lead Agency opportunity is a huge success is because it calls on our standard modes of delivery.

UKRI Representative

3.

Expansion of Lead Agency opportunities in recent years has meant that UK and US based researchers in almost all disciplines now benefit from increased opportunities for bottom-up collaboration, from arts and humanities and social sciences to biological sciences and STEM disciplines^{2,3}.

As of January 2023, more than £185m of research funding has been allocated via 233 Lead Agency awards to transatlantic research collaborations (£92m in UK funding and \$122m in US funding). UKRI-NSF Lead Agency collaboration has grown from 4 projects (c.£2m combined UK and US funding) in 2010 prior to the first formal Lead Agency opportunity (2013) to £41m (combined UK and US) funding and 55 projects in 2022⁴ (Figure 3.2).

More than £185m of research funding allocated across 233 Lead Agency awards.

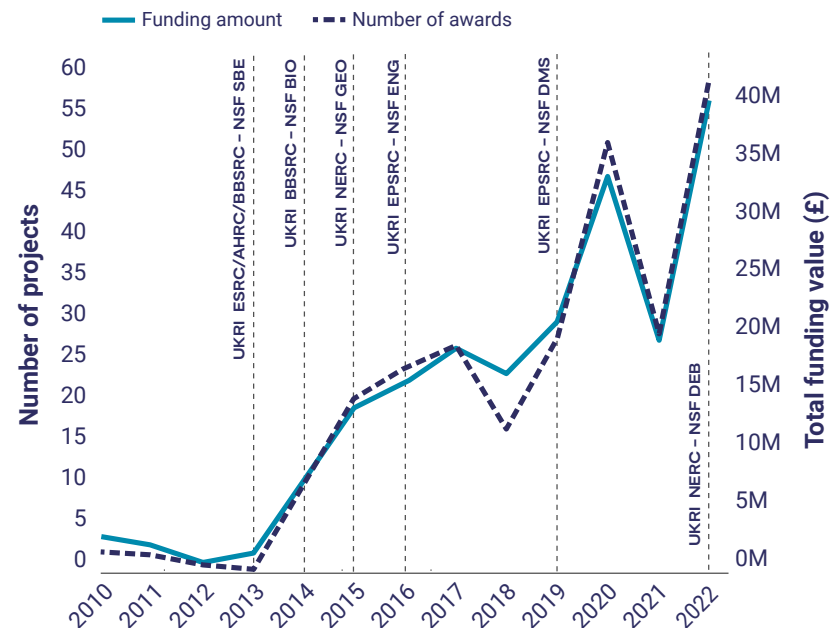


Figure 3.2: Lead Agency Awards (2010–2022)⁵

Source: UKRI North America, Gateway to Research

- The Lead Agency mechanism now covers five UKRI councils (AHRC, BBSRC, ESRC, NERC and EPSRC) and six NSF directorates (Directorate for Engineering, Directorate for Social Behavioural & Economic Sciences, Directorate for Mathematical & Physical Sciences, Directorate for Computer & Information Science & Engineering, Directorate for Geosciences, and Directorate for Biological Sciences).
- The areas that the Lead Agency doesn't cover include the Medical Research Council, as the NSF doesn't fund medical research, and the Science and Technology Facilities Council, which has a different funding mechanism.
- Opportunities funded before 2013 were via ad hoc Lead Agency arrangements.
- Projects and funding prior to the 2013 Lead Agency opportunity involved UKRI (RCUK) and NSF collaboration. (Total Funding Value refers to combined UK and US funding).

3.

3.3.2. Responding to new non-core funding opportunities

Core research funding is critical to the success of UK-US/Canada research collaboration because it is known, consistent and enables longer-term strategic decision-making regarding shared research priorities. However, several consultees also highlighted the important role that additional, non-core funding played in increasing the volume of transatlantic research activity, and the new relationships that non-core funding can help to foster. Thanks in part to the deep knowledge and networks held by the UKRI NA Office, UK, US and Canadian researchers have benefitted substantively from non-core funding opportunities in recent years. One such opportunity is the Fund for International Collaboration (FIC).

Established in 2018 by BEIS, FIC provided funding to support the objective of establishing the UK as a world-class research and innovation destination by enabling UK participation in global and multilateral programmes. Partner country funders, including but not limited to the US and Canada, provided matched effort creating truly collaborative joint programmes.

By 2022 a total of £160m in FIC funding had been allocated to international research projects in two waves. Across both funding waves, programmes involving collaboration with the US or Canada account for more than half of the total FIC funding allocation and approximately the same proportion of all bilateral funding, as shown in Figure 3.3. Almost two thirds (65%) of Wave 1 awards and 57% of Wave 2 awards went to programmes involving the US and/or Canada⁶.

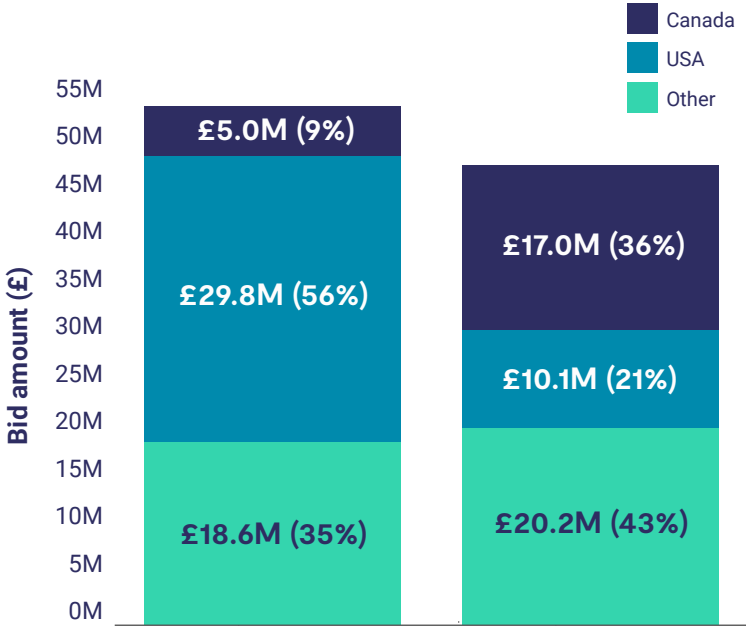


Figure 3.3: FIC Awards by Partner Country (2017-2022)
Source: UKRI International FIC monitoring data

£61.9m awarded to research projects with Canadian and US partners though the Fund for International Collaboration (FIC).

6. Of the FIC funding for bilateral programmes, 13% went to programmes with China and 7% went to programmes with India. (Note: China and India had other non-core funding streams available.)

3.

FIC funding has boosted collaboration across a range of important research areas, including earth and environmental science, climate change and human health (Figure 3.4).

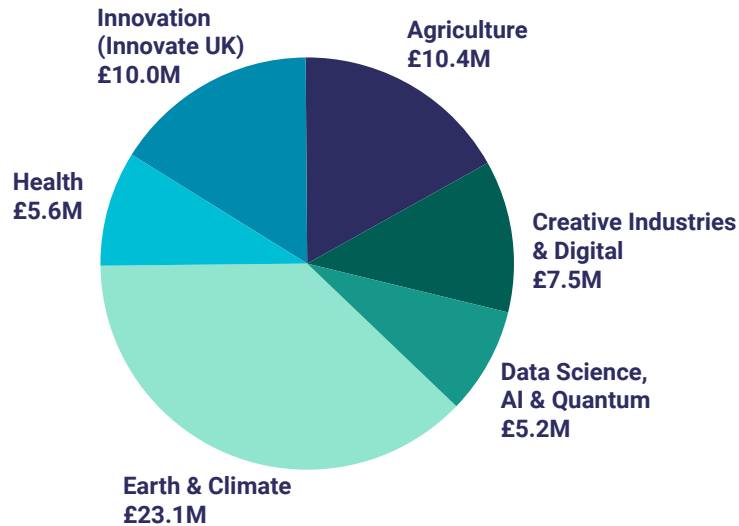


Figure 3.4: FIC Awards Involving North American Collaborators

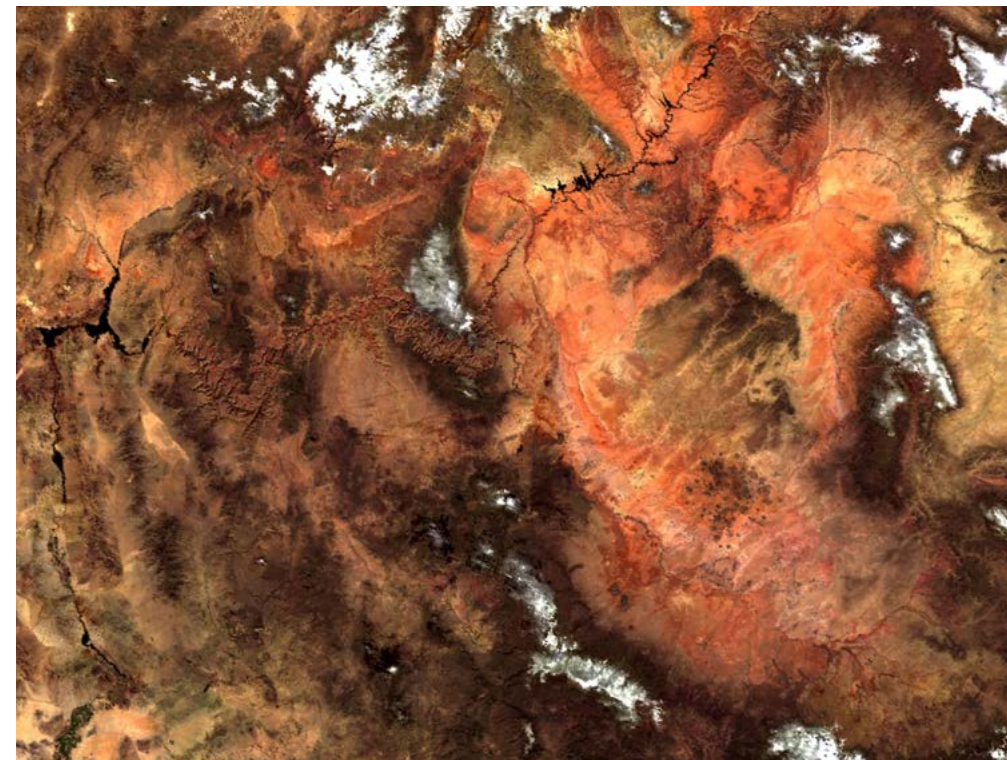
Source: UKRI International FIC monitoring data

While it is reasonable to expect, given the scale of North America research activity compared to other international research partners, that North America projects should make up a substantive proportion of FIC awards, consultees emphasised the important role that the UKRI NA Office played in facilitating a timely and coordinated response to the FIC opportunity. The more mature relationship with US partners meant that they were able to move quickly, yielding more opportunities through Wave 1. Newer relationships in Canada meant that more time was required to prepare, reflected in a 27% increase in funding for Canadian projects between Waves 1 and 2. The analysis of FIC funding also

serves as strong evidence of latent demand for transatlantic research collaboration – demand which could be met through sustainable increases in future funding – and as further evidence of the UKRI NA Office’s effective role as a catalyst for collaboration.

“ It can be feast or famine, and you have to be ready with major programmes that achieve government objectives, which is not always the easiest thing to do. Until FIC came along, we had a lot of ideas for collaboration, and conversations about it, but we didn’t have the money to do them.

UKRI Representative



3.

3.4. Strategically expanding the North American footprint

While the UKRI NA Office remains lean – the office’s staff team has grown from two people, to a total of five people in 2023 – several consultees pointed to strategic decisions regarding the expansion of office activity as a key contributor to the success of the office, and in turn to the growth of transatlantic research activity. The decision to establish and later expand the coverage of Lead Agency opportunities represent two such often-cited examples.

“ [UKRI – NSF Lead Agency] now broadly covers most of the coverable remit, which is incredible, it means that [Principal Investigators] in the UK and the US have a route for collaborating jointly, on pretty much whatever they want.

UKRI Representative

Consultees highlighted that the initial discussion regarding expanding Lead Agency opportunities between EPSRC and NSF were supported and arranged by the North America Office, ensuring that EPSRC representatives understood the NSF perspective. The North America Office subsequently “remained on hand to address any key questions and support changes to the management plan”.

The UKRI NA Office’s contribution to transatlantic research activity was viewed as having been further strengthened by the decision to expand the US Office to engage formally with Canada in 2019 and later establish a physical presence in Ottawa.

Consultations also highlighted the Office’s continued focus on more strategic use of resources, including for example, decisions to explore closer working with US Departments of Energy and Defense, (DOE and DOD), and larger cross-disciplinary initiatives that address issues of equality, diversity and inclusion, place and other underpinning systemic policy issues.

More recently, UKRI NA Office-facilitated cooperation between UKRI and NSERC in areas such as artificial intelligence and quantum science will serve dual strategic purposes, continuing to promote joint research efforts, while at the same time leveraging complementary infrastructures, skills and expertise to address shared research priorities. Canada is recognised as a world leader in quantum technologies, and the UK has set out ambitions on AI and quantum research in the new International Technology Strategy⁷.

“ [The UKRI NA Office is] working at a more strategic level to identify larger scale and more ambitious activities, and then to try and make that happen. [Take] our strategic engagement to identify easier ways of working together with both DOE and DOD. Taking a more strategic approach is key. Focusing on [initiatives that are] longer term, larger scale, more ambitious, and more holistic.

UKRI Representative

“ [The next five years should see] mechanisms in place that are broader spectrum, collaborative opportunities for the research communities in our countries to come together - to tackle climate and clean energy, those sorts of big societal problems.

UKRI Representative

⁷ Department for Science, Innovation and Technology (2023) Plans to make UK an international technology superpower launched. <https://www.gov.uk/government/news/plans-to-make-uk-an-international-technology-superpower-launched>

4.

Generating powerful new knowledge via transatlantic research

Collaborative transatlantic research has generated powerful new scientific knowledge that spans the breadth of scientific endeavours on both sides of the Atlantic, and scientific output has shown a clear upward trend over the past 15 years. This section uses evidence from consultations and data on publications from jointly funded UK-US projects to evidence the trend in new knowledge creation to which UKRI activity makes a contribution.

“ [The UK-US relationship] provides improved scientific knowledge; it helps us gain new scientific insights. We’ve generated peer-reviewed scientific articles through partnership with UKRI.

US Funding Partner

4.

4.1. Charting the growth in jointly funded research publications

Throughout the past 15 years, the volume of research output generated by UK-US collaboration has grown significantly. In a similar pattern to the upward trend in Lead Agency awards presented previously, Figure 4.1 charts the increase in research publications that acknowledge both UKRI and NSF funding since 2008⁸.

Between signing and re-signing of strategically important UK-US MoUs in 2013 and 2018 the volume of jointly funded research output saw a more than thirty-fold increase, followed by a further 50% increase between 2018 and 2021 (where analysis ends due to lag in timing of publications). Work continues through the UKRI NA Office to build relationships and mechanisms that will act as a catalyst for further joint scientific output. For example, in 2023 the NSF’s Computer and Information Sciences Directorate became the latest directorate to participate in Lead Agency, and the UKRI-NSF MoU has once again been renewed.

Since UKRI’s US presence in 2008, more than 3,000 joint UKRI-NSF funded publications supported.

While these strategic milestones will take time to manifest in research output, the current trend suggests that sustained focus on building transatlantic research collaboration will continue to yield powerful new knowledge well into the future.

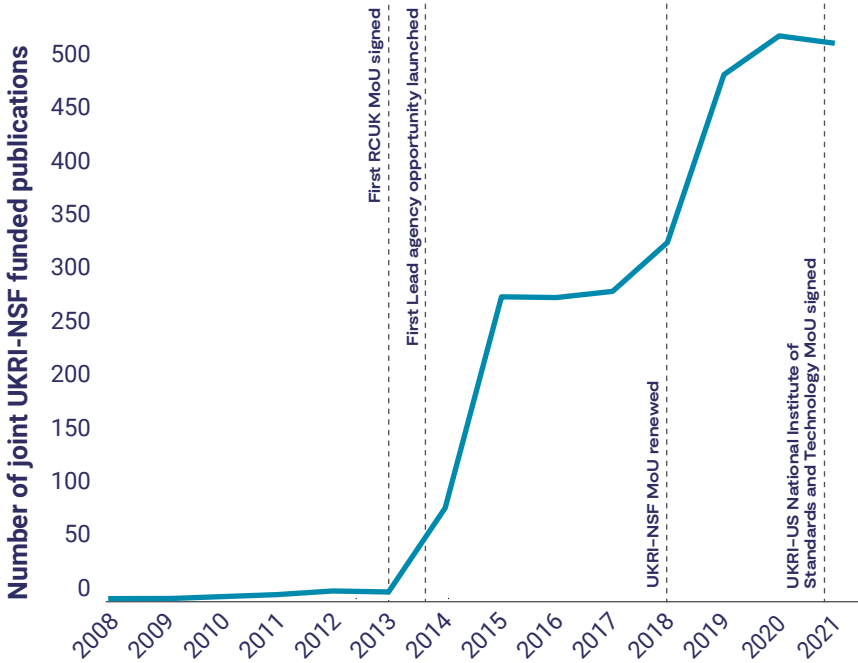


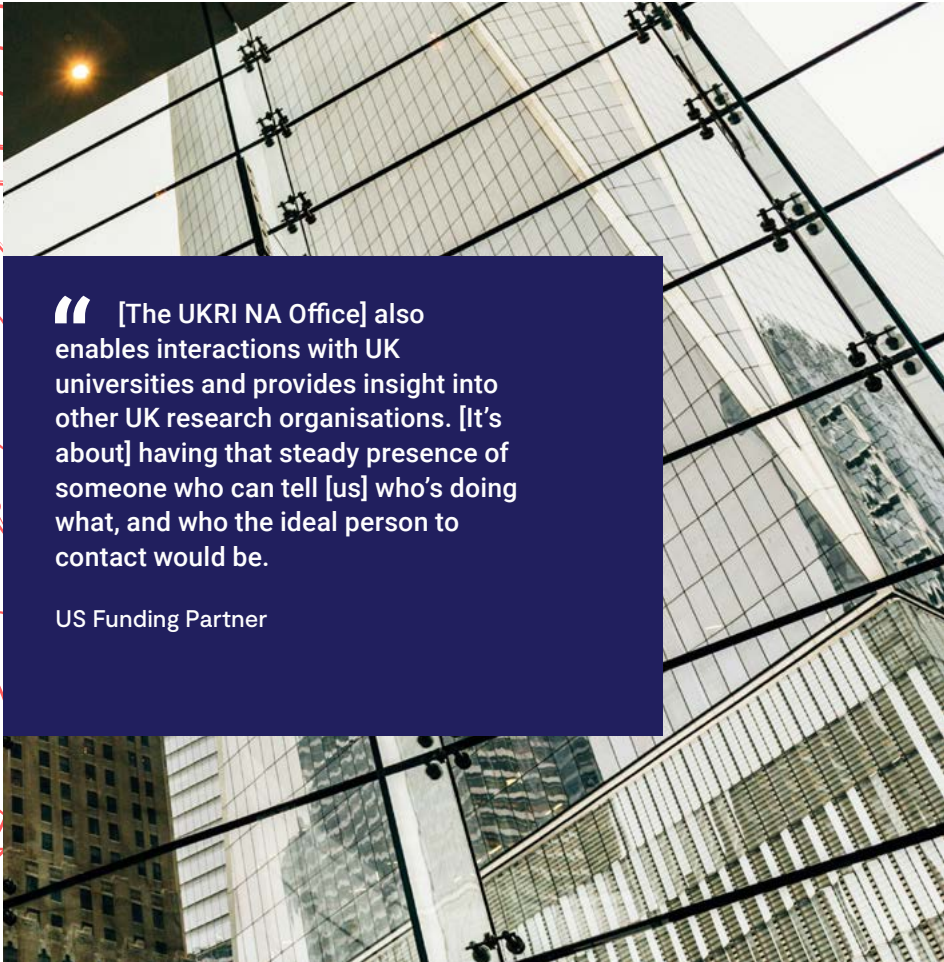
Figure 4.1: Trend in Joint UK-US Funded Research Output
Source: Lens.org (all publications acknowledging both NSF and UKRI funding, n=3,295)⁹

8 Note that this is based on a sample of research publications extracted from Lens.org using the following search term: Funding: ((NSF OR ("National Science Foundation" OR "National Science Foundation (NSF)")) AND (UKRC OR ("Arts and Humanities Research Council UK" OR ("Arts and Humanities Research Council GB" OR (EPSRC AND (AHRC AND (InnovateUK OR (ESRC OR ("Arts and Humanities Research Council AHRC" OR ("arts and humanities research council" OR ("Natural Environment Research Council" OR ("UK Arts and Humanities Research Council" OR ("Engineering and Physical Sciences Research Council" OR ("Economic and Social Research Council" OR (AHRC OR ("Biotechnology and Biological Sciences Research Council" OR ("Medical Research Council" OR (BBSRC OR ("UK Economic and Social Research Council" OR ("Innovate UK" OR ("UK Research and Innovation" OR (UKRI OR ("UKRI Science and Technology Facilities Council" OR (MRC OR (NERC OR ("UK Natural Environment Research Council" OR ("Research England" OR ("Science and Technology Facilities Council" OR (STFC OR (UKRC OR "UK Research Council". Note that this is not considered to be exhaustive.

9 N.B. data relates only to UKRI-NSF funded publications given that UKRI-NSF have the longest standing relationship. Data includes publications that acknowledge both NSF and UKRI funding. Note that publications may not all have resulted from joint funding (i.e., authors of the publication could have received separate grants from NSF and UKRI). The analysis is therefore intended to be illustrative of the trend in transatlantic research rather than definitive.

4.

Further analysis of publication data also demonstrates the breadth of transatlantic relationships involved in generating new knowledge. 31% of jointly funded research publications also received funding from universities (both in the UK and North America), and 37% of research publications received funding from a government department, emphasising the potential ripple effect of UKRI NA Office-facilitated opportunities.



“ [The UKRI NA Office] also enables interactions with UK universities and provides insight into other UK research organisations. [It’s about] having that steady presence of someone who can tell [us] who’s doing what, and who the ideal person to contact would be.

US Funding Partner

4.2. Illustrative impact of UK-US/Canada transatlantic research

While its contribution to scientific knowledge is vitally important, study consultees pointed to several examples of where UK-US/Canada research collaboration has delivered much more tangible impacts across a wide range of research areas, from human health to agricultural production and global warming. This sub-section presents case studies of impact built upon the examples provided by consultees.

“ Without NSF and UKRI working together on the basic discovery-driven research, we wouldn’t have the tangible benefits that we do have now in terms of what we know about the planet where the direction of the emerging technology is going.

US Funding Partner

4.2.1. Ecology and Evolution of Infectious Diseases

The multi-agency US ‘Ecology and Evolution of Infectious Diseases’ (EEID) programme began in 2003 and has awarded hundreds of millions of dollars to support research on the ecological, evolutionary, organismal and social drivers that influence the transmission dynamics of infectious diseases in humans, plants and animals. Since 2018, UK-US EEID research collaborations have secured \$12m from NSF and £11m in FIC funding via BBSRC for research into issues such as intra and cross-species disease transmission, the impact of changes in population networks, and the impact of immunosuppression on transmission¹⁰.

¹⁰ In 2018, BBSRC received funding from Funds for International Collaboration (FIC) to ensure that all Councils interest in EEID research was covered. In total BBSRC received £2M (2018), £8M (2019) and £1M in 2022.

4.

As concerns regarding the future frequency and impact of infectious diseases escalate in the aftermath of COVID-19, these collaborations are delivering numerous publications, research models, databases and engagement with non-academic audiences that enhance scientific knowledge and raise public awareness regarding the ecology and evolution of infectious diseases.

“ We have solicitations on targeted topics, like evolution of infectious diseases for example – that’s been quite productive.

US Funding Partner

EEID collaboration also serves as a useful illustration of how targeted non-core funding (in this case FIC) can augment a well-established research programme. Supplementary FIC funding for transdisciplinary EEID research engaged research councils including EPSRC, ESRC and NERC to help understand, predict and mitigate the effects of environmental interactions on infectious disease that will improve our ability to forecast and manage outbreaks, generate new cost-effective prevention and control methods, and enhance food safety and public health.

4.2.2. Understanding risks of sea-level rise via Thwaites Glacier research

If it were to melt, the West Antarctic Ice Sheet (WAIS) contains enough ice to cause sea levels to rise by 3.3 metres leaving vast swathes of land underwater, including parts of central London, Cardiff and Belfast, entire cities including Bangkok and Kolkata (among many others), and most of the Netherlands¹¹. To better understand the likelihood and risks of sea-level rise posed by the WAIS, UK and US scientists are collaborating to investigate one of the most unstable glaciers in Antarctica. Thwaites Glacier drains a vast part of the WAIS, extending over 192,000 square kilometres or 74,000 square miles – an area the size of Britain, or the

state of Florida. Initially facilitated by the UKRI NA Office before NERC took the lead for UKRI, the International Thwaites Glacier Collaboration (ITGC) is conducting research across the Glacier and its adjacent ocean region as part of the largest joint UK-US project undertaken on the southern continent in 70 years¹². Since 2018, more than 70 scientists and students have conducted research under six projects which seek to understand more about the glacier’s history, to investigate how the boundary of the glacier changes, how the core of the glacier is evolving, and to use the resulting data to create better forecasts of the glacier’s retreat and increased ice loss. At the time of writing, ITGC research has produced more than 100 publications, created more than 40 research databases and models, provided content for dozens of engagement activities including news segments and articles, press releases and workshops, and has been the focus of briefings to UK policy-makers. Most recently, in 2023, UK researchers have developed and applied novel deep (machine) learning methods to measure ice speeds and map ice fractures, showing 30% to 45% changes in ice speed relative to previous averages¹³.

11 <https://coastal.climatecentral.org/>

12 <https://thwaitesglacier.org/about/itgc>

13 Surawy-Stepney, T., Hogg, A.E., Cornford, S.L. et al. Episodic dynamic change linked to damage on the Thwaites Glacier Ice Tongue. *Nat. Geosci.* 16, 37–43 (2023). <https://doi.org/10.1038/s41561-022-01097-9>

4.

4.2.3. Signals in the Soil (SitS): Better understanding the most fundamental natural assets

UK-US funding has also been used to build a better understanding of some of the world's most fundamental, yet often overlooked natural assets. Soils are the foundation of terrestrial ecosystems that support food production and economic prosperity. They are the source of most antibiotics used to fight human disease, control the movement of water and chemicals between earth and atmosphere, and act as both a source and sink for gases such as oxygen, carbon dioxide and methane. As global demands rise for food, fibres and bioenergy, and as land is degraded due to land use change, poor agricultural practices, contamination and urbanisation, advancing our collective understanding of soil ecosystems and our capacity to manage this vital resource becomes increasingly important.

Led in the UK by NERC with the US NSF, since 2017 Signals in the Soil has provided over £13m in joint UK-US funding¹⁴ to develop new solutions for healthy and resilient soils, thereby increasing food security, tackling climate change, and enhancing public health. UK participation in the long-running US SitS programme was enabled by targeted non-core funding that led to a total of 14 interdisciplinary collaborative research projects, involving 12 UK universities and research organisations, and providing opportunities for early career UK researchers to visit US partner agencies to learn new research techniques and deepen the collaboration.

Over £13m joint UK-US funding to develop new solutions for healthy and resilient soils.

In September 2020, UKRI organised a joint workshop to bring together the projects funded under the SitS programme. Over 100 researchers and funders convened for discussions around the development of new soil sensors, to advance scientific understanding of soil ecosystems and



combat critical issues such as land degradation and soil contamination. At the same time, the UK Government's Science and Innovation Network in the US organised a virtual industry panel with participation from Microsoft and large-scale US agricultural companies to help researchers understand the potential for commercial application of SitS research projects. As a result of these two initiatives, UK researchers from Cranfield University collaborated with US partners, building relationships with Colorado State University and University of California, Davis (UC Davis) and student exchanges with the University of Arizona and Lawrence Berkeley National Laboratory. These collaborations illustrate how valuable jointly working with the UKRI North America Office and the Science and Innovation Network can be to an institution intent on increasing its global reach and connections¹⁵. Positive experiences of the partnership sparked interest from NSF in future collaboration with UKRI on Signals in the Soil research, further strengthening this partnership.

“ The UKRI North America Office helped us find speakers, industry connections and facilities to be able to deliver the workshop. While we only worked with the UK on it for one year, that momentum helped to ensure that Signals in the Soil continued with NSF and USDA NIFA.

US Funding Partner

¹⁴ £7.7m and \$8m respectively

¹⁵ <https://www.gov.uk/government/publications/science-and-innovation-network-usa-promotes-uk-us-collaboration-in-precision-agriculture>.

4.

4.2.4. Advancing social, behavioural and economic sciences

Agreed in 2013 between the NSF Social, Behavioural and Economic Sciences Directorate (NSF-SBE) in the US and ESRC with AHRC and BBSRC in the UK, the NSF-SBE Lead Agency was the first such opportunity between the UK and the US. Designed to help support international research partnerships between the two countries, this opportunity strengthened valuable research links that already existed, while also removing some of the barriers to international research collaboration by offering a single route for funding applications. Since 2013, the NSF SBE Lead Agency opportunity has supported more than a dozen research projects between US and UK researchers, to the value of more than £7m (combined UK and US funding) spanning topics such as history and heritage, language and communication, commerce, economics, information sciences, law and psychology¹⁶. At the time of writing, eight of these projects had been completed, delivering new knowledge, strengthened US-UK research relationships and new ideas for collaborative research in future. For example, researchers at the University of Warwick and the University of Michigan studying the cognitive foundations of reciprocity are understanding more about how and why we cooperate, and researchers within the Department for Land Economy at the University of Cambridge and peers at the University of Maryland have been advising policy makers in the UK, the US and the EU on the impact of internationalisation on wind energy technology supply chain manufacturing and innovation.



£7m in joint funding to date for a dozen research UK-US projects in the economic and social sciences through Lead Agency.

16 Approximate combined value of UK and US funding recorded as c.£4m and c\$5m respectively. N.B. includes three estimated dollar values.
 17 SBE-RCUK Lead Agency: The Cognitive Foundations of Human Reciprocity.
 18 SBE-RCUK Lead Agency: Co-location of manufacturing and innovation: drivers and impacts of technological innovation along wind energy global value chains.

5.

Facilitating deeper transatlantic research partnerships

The most overwhelmingly consistent finding from interviewees on both sides of the Atlantic concerned the extent to which the physical presence and activity of the UKRI North America Office has facilitated deeper transatlantic research partnerships. This section draws predominantly on findings from qualitative research to highlight the numerous ways in which UKRI NA Office activity is seen to have deepened transatlantic research relationships.

“ The strength of relationship between the [government department] and the UKRI NA Office has been growing. Staff enjoy working with UKRI, it has [also] enabled them to work with several UK universities that they wouldn't have worked with otherwise.

US Government Official

5.

5.1. Building deep knowledge, networks and trust

The UKRI North America Office has pro-actively built upon existing UK-US/Canada relationships and established new mutually beneficial relationships, including between Canada and the UK. Consultees frequently referred to an uncertain geopolitical landscape and the increasing importance of trusted research relationships. They highlighted the notable contribution that the physical presence of the UKRI NA Office has made to establishing and sustaining those relationships.

“ It’s this word trust, again, it’s really important that that’s been built up, and I think that leaves us free to explore new things.

UKRI Representative

In some cases, the UKRI NA Office also acts as a catalyst to support direct engagement between UK and NA government departments, as well as funders. However even in this more facilitative role, consultees noted the pro-active approach that the NA Office team takes to keeping ‘up to speed’ on how collaborative research activity is progressing.

“ We’re now doing most of our work with UK through the MOD. Take the antineutrino detector for example, we’re now looking at the UK as a location, and as a partner. [The UKRI NA Office] helped facilitate that partnership. UKRI North America also enabled interactions with UK universities. Insight into UK organizations - having that steady presence of someone who can tell them who’s doing what, and who the ideal person to contact would be. On antineutrino detection we were able to leverage the unique capabilities of UK including, for example, their underground laboratory.

US Funding Partner

Analysis of the location of a sample of core funding awards provides a visual sense of the breadth of UK-US networks, often facilitated in some way by the UKRI NA Office. Core funding has enabled transatlantic research collaboration from coast to coast of the US and even beyond to Alaska and Hawaii.



Figure 5.1: UK-US Lead Agency Collaboration

Source: UKRI, Gateway to Research

Interviewees highlighted how important the actual delivery of practical collaborative research programmes is for building deeper knowledge, networks and trust. Programmes could be research or training oriented and are well illustrated by two recent examples of UKRI NA facilitated joint working in Canada – the Canada Inuit Nunangat-United Kingdom (CINUK) Arctic Research Programme, and the UK-Canada Globalink Doctoral Exchange Scheme.

5.

5.1.1. CINUK Arctic Research: Strengthening Relationships Through Science & Culture

The UKRI NA Office has helped to secure more than £12m in targeted non-core funding¹⁹ to support 13 projects under the Canada-Inuit Nunangat-United Kingdom (CINUK) Arctic Research Programme.

CINUK has been highlighted by study consultees as being particularly significant for building strong relationships with Canadian partners because it focuses on environmental issues whilst also supporting indigenous groups and striving to raise cultural awareness – an issue that has been high on the Canadian government’s agenda in recent years, reflected in recent policies such as the Inuit Nunangat Policy (2022)²¹ and the Arctic and Northern Policy Framework (also 2022)²¹.


CINUK funds research projects that tackle climate-driven changes to the environments in Inuit Nunangat (an area that makes up nearly one third of Canada’s landmass and more than 50% of its coastline) and the impact on Inuit communities health and wellbeing.

“ Something we’re very proud of is having Inuit scientific leads... that’s a model system that we’d like to reproduce in other areas with other countries and the UKRI North America Office provided very good support to that.

Canadian Funding Partner

Programme partners including the Inuit Tapiriit Kanatami, UKRI, the National Research Council of Canada and the Fonds de Recherche du Quebec are exploring two core themes:

- **Theme 1** - Arctic ecosystems and their impact on Inuit communities: including projects such as Carving out Climate Testimony: Inuit Youth, Wellness & Environmental Stewardship, and Beavers and Socio-ecological Resilience in Inuit Nunangat.
- **Theme 2** - Mitigations and adaptations for resilience: including projects such as Renewable Energy Microgrid Integration for Remote, Off-grid Cabins in Nunavut and Nuna.



£12m to support 13 projects under the Canada-Inuit Nunangat-United Kingdom Arctic Research Programme.

19 This is the combined funding value of the UK and Canada (£7.63m UK funding and CAD \$6.7m Canadian funding)

20 <https://www.rcaanc-cirnac.gc.ca/eng/1650556354784/1650556491509>

21 <https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587>

5.

5.1.2. UK-Canada Globalink Doctoral Exchange: Building Scientific Networks of the Future

Canadian funder representatives also pointed to the UK-Canada Globalink Doctoral Exchange as an example of how UKRI NA Office-facilitated education programmes help to strengthen current relationships, while also acting as a catalyst for future UK-Canada scientific networks.

The £2.3m (combined funding) UK-Canada Globalink Doctoral Exchange scheme fosters international collaboration and research excellence between the UK and Canada. Via UKRI and Mitacs (a Canadian not-for-profit organisation focussed on translational research and knowledge exchange), doctoral students can apply to undertake a 12-week research placement in Canada where they will carry out a research project spanning everything from the impact of social networks on wellbeing to investigating the evolution of cancer cells.

The programme aims to further doctoral students' studies and enhance their research career prospects, whilst also encouraging them to undertake network-building activities that help them to establish and enhance collaboration between the UK and Canada.

By allowing students to take part in network-building activities that are not directly related to their areas of expertise, the Globalink scheme establishes transatlantic multidisciplinary connections.

“ We are delighted that one of our DPhil students has started a competitive 12-week research placement funded by the UKRI UK-Canada Globalink Doctoral Exchange Scheme. Her placement project will investigate the neuropathological mechanisms of psychiatric disorders, focussing on those with early onset, in the Computational Brain Anatomy (CoBrA) laboratory at the Douglas Mental Health University Institute, McGill.

UK University Statement on UK-Canada Globalink

5.2. Working together to progress common policy objectives and shared values

The UKRI North America Office facilitates research collaborations that allow partners to work together to progress common policy objectives and shared values. Given the office's knowledge of and ability to look across portfolios in both the UK and North America, study consultees emphasised how the UKRI NA Office is uniquely placed to facilitate a strategic, cross cutting view of research policy that connects potentially disparate / siloed research activities. Further, study consultees highlighted how the UKRI NA Office has also facilitated collaboration on Equality, Diversity and Inclusion (EDI), deemed to be particularly relevant on both sides of the Atlantic given recent UKRI, NSF and CRCC EDI Strategies²².

UKRI NA Office-facilitated partnerships have helped to advance shared policy and research goals at both government-to-government and funder-to-funder levels, on issues as wide-ranging as climate change mitigation, clean energy, nuclear non-proliferation, and digitisation. Two case study examples regarding climate change and clean energy illustrate how this collaborative research activity is addressing some of the most salient shared national policy objectives in the UK, the US and Canada.

A total of £38m leveraged to promote cutting-edge, interdisciplinary, use-inspired clean energy and climate change research.

22 UKRI (2023) EDI Strategy <https://www.ukri.org/what-we-offer/supporting-healthy-research-and-innovation-culture/equality-diversity-and-inclusion/edi-strategy/>; NSF (2022) DEIA Strategic Plan https://www.nsf.gov/od/oecr/reports/DEIA_Strategic_Plan_2022.pdf; and CRCC (2018) Tri-Agency Equity, Diversity and Inclusion Action Plan https://www.nserc-crng.gc.ca/InterAgency-Interorganismes/EDI-EDI/Action-Plan_Plan-dAction_eng.asp

5.

5.2.1. Global Centres in Clean Energy and Climate Change; Subpolar North Atlantic Research

Climate change mitigation is an increasingly important global issue and is attracting heightened focus from governments in the UK, US and Canada. The UK's Climate Change Strategy²³ sets out the need for research that sheds light on climate change risks and highlights the importance of supporting the transition to clean energy in the path to net zero.

The US Inflation Reduction Act²⁴ provides billions of dollars of investment into clean energy and climate action with the goal of delivering economic benefits alongside climate change mitigation. Canada's 2030 Emissions Reduction Plan²⁵ highlights the need for research and development that advance clean energy technologies, and the Canadian Government is investing \$100 million in support of transformative science including fundamental and applied research and knowledge transfer. Transatlantic collaboration brings together researchers to work on shared goals and progress climate change mitigation on both sides of the Atlantic.

Led by NSF in collaboration with UKRI, the Natural Sciences and Engineering and Social Sciences and Humanities Research Councils of Canada (NSERC and SSHRC), with participation from Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Global Centers programme is funding cutting-edge, interdisciplinary, use-inspired research in clean energy and climate change. The UKRI NA Office played a fundamental role in catalysing UKRI partnership and co-development of this major initiative, identifying and working to negotiate £18m of UKRI investment which leverages ~£38m of partner agency investment²⁶, around £56m in total.

Global Centers in Clean Energy and Climate Change will encourage large-scale collaborative research on use-inspired themes that can deliver clear societal benefits, such as generating new clean energy solutions. The opportunity aligns with UKRI's strategic theme of building a green future

and utilises research and innovation talents on both sides of the Atlantic to better equip the UK with solutions for achieving net zero.

The UKRI NA Office also played an instrumental role in facilitating collaborative research on the behaviour of currents in the Atlantic Ocean that will help to improve future climate predictions. The UKRI NA Office brought together scientists and researchers from both countries, identifying potential partners in the US and facilitating discussions between UK and US researchers. The joint UK-US programme on the Subpolar North Atlantic will extend observations to span a decade, informing scientific endeavours and international climate policies²⁷, and addressing two important challenges, namely:

- Combining observations and ocean-climate models to deliver a step change in quantitative understanding of processes that impact subpolar variability.
- Determining how these impacts affect the ocean-atmosphere-ice system.

23 UK Export Finance (2021-2024) Climate Change Strategy <https://www.ukri.org/what-we-offer/supporting-innovation/innovation-bbsrc/transformative-technologies/>

24 The White House (2023) Building a clean energy economy: a guidebook to the Inflation Reduction Act's investments in clean energy and climate action <https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/>

25 Government of Canada (2022) Canada's 2030 Emissions Reduction Plan. <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030.html>

26 USD\$28m; CAD\$20m; AUS\$7m

27 Including, for example, the United Nations High Seas Treaty that aims to protect the planet's oceans from pollution, overfishing and global warming. See: <https://climatechampions.unfccc.int/why-the-high-seas-treaty-is-a-breakthrough-for-the-ocean-and-the-planet/>

5.

5.2.2. Equality, Diversity & Inclusion

A growing body of research provides evidence that diversity delivers benefits across society, including within the research ecosystem²⁸. Benefits of equality, diversity and inclusion, and the work required to deliver them, are increasingly prominent within funder policies in the UK, the US and Canada. Since 2018, leading funder agencies in every jurisdiction have published detailed and ambitious new policies that seek to promote and enhance EDI across their research bases.

UKRI's International EDI Review²⁹ aims to understand the range and effectiveness of current EDI interventions in the global research environment, whilst acknowledging the limitations that can occur in certain cultural contexts. It highlights challenges that have the potential to impact EDI in research globally, such as the underrepresentation of women in research and underrepresentation of specific ethnicities within doctoral studies. More specific challenges can arise in certain contexts, including the underrepresentation of indigenous peoples in research and academia.

“ Equality, Diversity and Inclusion (EDI) continues to be a key focus both for UKRI and within the UK, as well as within Canada and the US.

UKRI Representative

Published in 2023, UKRI's first EDI strategy discusses the need for more diversity and inclusion in research, highlighting that a broader range of talent will boost the success of UKRI's research outcomes and support a fairer knowledge economy.

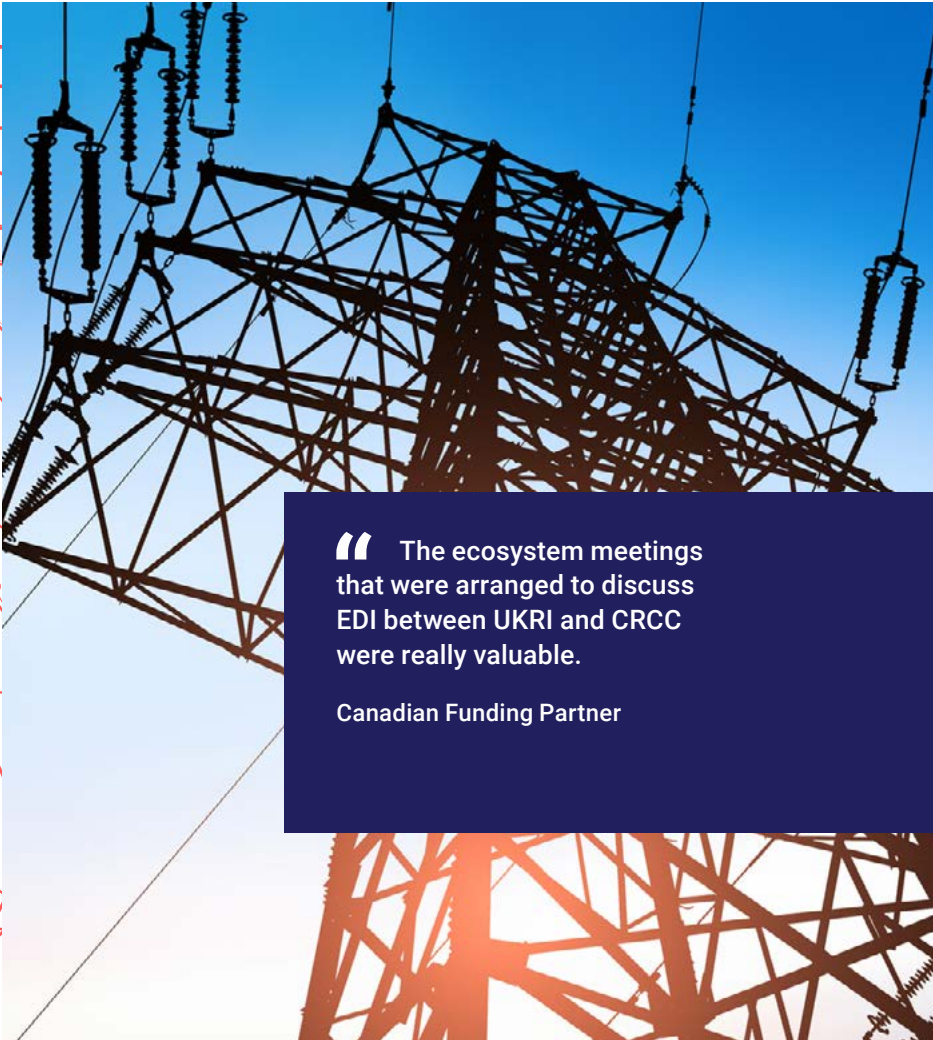
In 2022, NSF's Diversity, Equity, Inclusion and Accessibility (DEIA) strategy³⁰ identified opportunities to improve EDI efforts by removing barriers at higher grade levels, ensuring consistent EDI practices across directorates, and to strengthen EDI data capabilities. CCRC's 2018 –



- 28 See for example McKinsey's series of reports on the benefits of diversity in business: <https://www.mckinsey.com/featured-insights/diversity-and-inclusion/diversity-wins-how-inclusion-matters>; and various evidence from academic bodies including the American Council on Education <https://www.acenet.edu/Documents/BoardDiversityStatement-June2012.pdf>; Advance HE <https://www.ukri.org/wp-content/uploads/2020/10/UKRI-020920-EDI-EvidenceReviewInternational.pdf>; Universities UK <https://www.universitiesuk.ac.uk/topics/equality-diversity-and-inclusion>
- 29 Advance HE (2019) Equality, diversity and inclusion in research and innovation: international review. <https://www.ukri.org/what-we-offer/supporting-healthy-research-and-innovation-culture/equality-diversity-and-inclusion/evidence-base/>
- 30 National Science Foundation (2022-2024) Diversity, Equity, Inclusion & Accessibility (DEIA) Strategic Plan https://www.nsf.gov/od/oecr/reports/DEIA_Strategic_Plan_2022.pdf

5.

2025 EDI Action Plan³¹ highlights how much more needs to be done to address systemic barriers that limit full participation of all talented individuals, and sets out measures to increase equitable and inclusive access to funding opportunities and deliver a more inclusive post-secondary research system more generally.



“ The ecosystem meetings that were arranged to discuss EDI between UKRI and CRCC were really valuable.

Canadian Funding Partner

The UKRI NA Office has been recognised by study consultees as playing an integral role in coordinating workshops that build upon these shared EDI values and objectives. Consultees pointed to the outcomes of a CRCC-UKRI meeting that led to a professional workshop on EDI. Held in early 2023, the workshop focussed on efforts underway on both sides to promote more equitable, diverse and inclusive research cultures, and to establish valuable connections to facilitate future collaborations in this area. This type of UKRI NA Office-facilitated EDI activity is clearly aligned to the priorities of senior leadership in both UKRI and CRCC, and the UKRI NA Office’s central role was made clear through the qualitative research.

“ International collaboration and equitable partnerships are vital to the delivery of UKRI’s strategy and the challenges we face. The CRCC-UKRI partnership is a great example of how to work together to achieve common goals, including implementation of EDI policies/practices and working toward net zero. UKRI looks forward to building on the great work done with the CRCC.

Statement by UKRI Chief Executive

“ Recognizing that multiple perspectives are required to tackle complex, transboundary problems, the CRCC is committed to broadening Canada’s research networks and enhancing opportunities for collaboration with diverse partners around the world.

Statement by CCRC

31 Canada Research Coordinating Committee (2018-2025) Tri-Agency EDI Action Plan https://www.nserc-crsng.gc.ca/InterAgency-Interorganismes/EDI-EDI/Action-Plan_Plan-dAction_eng.asp

5.

5.3. Fostering the future of increasingly significant transatlantic research partnerships

UKRI's Strategy³² recognises that research is a global endeavour, and that collaborating with international partners on research priorities that tackle global challenges is essential to ensuring that the UK continues to be a world leader in research and innovation.

“ There's real opportunity to develop world leading partnerships when we think about the scale and the kind of access to expertise we have in North America.

UKRI Representative



5.3.1. The UKRI–NSF Relationship: A Pillar of Transatlantic Research Collaboration

Established in 1950, NSF is an independent US government agency that employs around 1,700 people and in 2023 had an annual budget of around USD 10 billion. NSF's mission is to promote the progress of science, advance national health, prosperity, and welfare, and to secure national defence. The NSF supports research and education in science, mathematics, engineering, and technology disciplines through grants, fellowships, and other forms of support.

One of the foremost objectives at the start of RCUK's US presence was to identify and implement joint mechanisms with NSF which would enable increased cooperation between UK and US researchers. This led to the creation of the inaugural RCUK-US NSF MoU on Research Cooperation in 2013 and consequent renewals in 2018 and 2023. The relationship has gone from strength to strength, acting as a catalyst for a wide range of collaborative research activity. It underpins the 233 Lead Agency projects supported across UKRI Research Councils and NSF Directorates, provides a key mechanism through which research communities on both sides of the Atlantic can be mobilised to respond quickly to targeted non-core funding opportunities, and is a lynchpin of shared knowledge and understanding regarding UK-US research priorities.

Since 2011, UKRI & NSF have jointly funded total of **30 research programmes** to the value of more than **£200m**.

32 UKRI (2022) UKRI strategy 2022 to 2027: transforming tomorrow together. Available at: <https://www.ukri.org/publications/ukri-strategy-2022-to-2027/>

5.



Since 2011 UKRI and NSF have jointly funded a total of 30 research programmes to the value of more than £200m³³, from both core and targeted non-core funding sources. These programmes have engaged all UKRI Research Councils, seven out of eight NSF Directorates, and have leveraged input from at least a dozen other funding partners in the US and internationally including US Federal Government departments such as the Departments of Energy and Defense (DOE, DOD) and USDA's National Institute of Food and Environment (NIFA), US funders including

the National Institutes of Health (NIH) and international partners in Canada, Germany and Australia (among others).

For example, in 2020 NERC and NSF worked together with the NIH, the National Oceanic and Atmospheric Administration and NIFA to support the Belmont Forum's Climate, Environment and Health Awards. Managed by NERC. The awards brought together a total of 13 funders from 10 countries and encouraged applications from 59 eligible teams of researchers. Awards were allocated to nine research teams involving 69 researchers from 20 countries, with UK-US collaboration across six of the nine projects.

Since 2008, over 3,000 academic publications have received funding from both NSF and UKRI³⁴. In 2023 the UKRI-NSF MoU was renewed, paving the way for continued innovative research collaboration through a deepened transatlantic research partnership.

“ My hope and expectation for the next five years [for the NSF and UKRI] is that we will put mechanisms in place that are broader spectrum, collaborative opportunities for the research communities in our countries to come together... to tackle climate and clean energy, those sorts of big societal problems.

US Funding Partner

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- 33 Based on programmes with known funding values and conservative estimates of programmes for which funding values were not available.
 - 34 N.B. data relates only to UKRI – NSF funded publications given that UKRI – NSF have the longest standing relationship. Data includes publications that acknowledge both NSF and UKRI funding. Note that publications may not all have resulted from joint funding (i.e., authors of the publication could have received separate grants from NSF and UKRI). The analysis is therefore intended to be illustrative of the trend in transatlantic research rather than definitive.

5.

5.3.2. Future Opportunities Example: Quantum and AI

Between 2020 and 2021 UK-US governments signed a Declaration on Cooperation in Artificial Intelligence Research and Development and a Joint Statement on Cooperation in Quantum Information Sciences and Technologies, aligning both countries' goals in advancing AI and quantum through collaborative research. These commitments have paved the way for further collaboration on two of the most salient scientific and technological research areas, including a series of UKRI NA Office-facilitated opportunities that are either already being explored, or that are being targeted.

Among other research priorities, the expansion of an existing Lead Agency opportunity with the US National Science Foundation (NSF) creates opportunities for UK-US bottom-up collaboration in quantum and AI, aligned to shared UK and US strategic research and innovation objectives. AI has been recognised as a key driver of the US's research and innovation ecosystem, with AI research essential to maximising its potential³⁵. The UK government has also set out its National AI Strategy, emphasising that new environments for collaborative AI are key to ensuring the UK's AI ecosystem success³⁶.

The US's strategic overview of quantum³⁷ also highlights the importance of sustaining international collaboration and cooperation, further emphasising the benefits of the expansion of the Lead Agency opportunity for research in these areas. This aligns with the UK's National Quantum Strategy, which sets out a ten-year vision, plan and commitment to become a leading quantum-enabled economy³⁸.

The opportunities for collaborative research in quantum and AI facilitated by the UKRI NA Office contribute towards UKRI's Transformative Technologies strategy, enabling the development and innovation of data-intensive methods³⁹. UK-US collaboration in quantum and AI could support the delivery of the Transformative Technologies strategy through the development of innovative software and algorithms that can process large amounts of research data leading to distinctive discoveries in a broad range of disciplines.

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- 35 National Artificial Intelligence Research Resource Task Force (2023) Strengthening and Democratizing the U.S. Artificial Intelligence Innovation Ecosystem: An Implementation Plan for a National Artificial Intelligence Research Resource <https://www.ai.gov/wp-content/uploads/2023/01/NAIRR-TF-Final-Report-2023.pdf>
 - 36 HMS Government (2022) National AI Strategy <https://www.gov.uk/government/publications/national-ai-strategy/national-ai-strategy-html-version>
 - 37 National Science & Technology Council (2018) National Strategic Overview for Quantum Information Science <https://www.quantum.gov/strategy/>
 - 38 HMS Government (2023) National Quantum Strategy. <https://www.gov.uk/government/publications/national-quantum-strategy>
 - 39 UKRI (2023) Transformative Technologies. <https://www.ukri.org/what-we-offer/supporting-innovation/innovation-bbsrc/transformative-technologies/>

I.

Appendix 1: List of Abbreviations

Abbreviation	Full Term	Abbreviation	Full Term
AHRC	Arts and Humanities Research Council	NIST	US National Institute of Standards and Technology
AI	Artificial Intelligence	NSERC	Natural Sciences and Engineering Research Council of Canada
BBSRC	Biotechnology and Biological Sciences Research Council	NSF BIO	NSF Directorate for Biological Sciences
BEIS	Department for Business, Energy and Industrial Strategy	NSF CISE	NSF Directorate for Computer and Information Science and Engineering
CINUK	Canada Inuit Nunangat-United Kingdom	NSF DEB	NSF Division for Environmental Biology
CRCC	Canada Research Coordinating Committee	NSF DMS	NSF Division for Mathematical Sciences
DEIA	Diversity, Equity, Inclusion and Accessibility	NSF ENG	NSF Directorate for Engineering
DOD	US Department of Defense	NSF GEO	NSF Directorate for Geosciences
DOE	US Department of Energy	NSF SBE	NSF Directorate for Social, Behavioral and Economic Sciences
EDI	Equality, Diversity and Inclusion	OSRD	Office of Scientific Research and Development
EEID	Ecology and Evolution of Infectious Diseases	R&D	Research and Development
EPSRC	Engineering and Physical Sciences Research Council	RCUK	Research Councils United Kingdom
ESRC	Economic and Social Research Council	SitS	Signals in the Soil
F2F	Funder-to-Funder	SSHRC	Social Sciences and Humanities Research Councils of Canada
FIC	Fund for International Collaboration	UKRI	United Kingdom Research and Innovation
G2G	Government-to-Government	UKRI NA Office	UKRI North America Office
ITGC	International Thwaites Glacier Collaboration	USDA	United States Department of Agriculture
MOD	UK Ministry of Defence	WAIS	West Antarctic Ice Sheet
MoU	Memorandum of Understanding		
NERC	Natural Environment Research Council		
NIFA	US National Institute of Food and Agriculture		

II.

Appendix 2: List of US/Canadian Funding Partners

Organisation	Jurisdiction	Description
AAFC (Agriculture and Agri-Food Canada)	Canada	Established in 1994, AAFC is a Canadian federal government department that employs around 5,000 people. Its average annual budget is around CAD 1 billion. The main focus of its research is agriculture and agri-food science, including food safety, plant and animal health, and environmental sustainability.
BMGF (Bill & Melinda Gates Foundation)	US	Established in 2000, BMGF is a US-based private foundation that employs around 3,000 people. Its average annual budget is around USD 8 billion. The foundation focuses on global health, education, and poverty alleviation.
CFI (Canada Foundation for Innovation)	Canada	Established in 1997, CFI is an independent Canadian funding organization employing around 100 people. Since its creation, the CFI has committed almost CAD 10 billion to support over 12,000 projects. CFI supports research infrastructure projects, focusing on areas such as health, environment, energy, and information technologies.
CFIA (Canadian Food Inspection Agency)	Canada	Established in 1997, CFIA is a Canadian government agency that employs around 6,500 people. CFIA's main focus is on food safety, animal and plant health, and regulating biotechnology-derived products.
CIFAR (Canadian Institute for Advanced Research)	Canada	Established in 1982, CIFAR is a Canadian research institute employing around 400 researchers globally. Its average annual budget is around CAD 22 million. CIFAR's main focus is on interdisciplinary research in areas such as artificial intelligence, brain and behavior, and Earth system evolution.
CIHR (Canadian Institutes of Health Research)	Canada	Established in 2000, CIHR is a Canadian federal funding agency that supports almost 14,000 trainees and researchers across Canada. Its average annual budget is around CAD 1 billion. CIHR's main focus is on health research, supporting researchers and trainees in various fields such as cancer, infectious diseases, and mental health.
CNRS (Centre national de la recherche scientifique)	Canada	Founded in 1939, CNRS is a French public research organization that employs around 33,000 people. CNRS conducts interdisciplinary research in various fields, including life sciences, physical sciences, humanities, and social sciences.
CSA (Canadian Space Agency)	Canada	Established in 1989, CSA is a Canadian government agency that employs around 700 people. Its average annual budget is around CAD 350 million. CSA's main focus is on space research and technology, supporting projects related to Earth observation, satellite communications, and space exploration.



Organisation	Jurisdiction	Description
DoD (US Department of Defense)	US	Established in 1947, the DoD is a US government department that employs around 1.3 million people (including civilian and military personnel). Its average annual budget for procurement and research and development is around USD 270 billion. The DoD supports research in various areas, including defense, security, and emerging technologies.
DOE (US Department of Energy)	US	Established in 1977, the DOE is a US government department that employs around 14,000 people. Its average annual budget is around USD 50 billion. The DOE focuses on research related to energy, environmental, and national security science and technology.
Fermilab	US	Established in 1967, Fermilab is a US Department of Energy national laboratory that employs around 1,750 people. Fermilab conducts research in particle physics, accelerator science, and related fields.
FRQ (Fonds de recherche du Québec)	Canada	Established in 2011, FRQ is a Quebec government funding agency that supports research in various fields, including natural sciences, engineering, health, and social sciences.
FRQSC (Fonds de recherche du Québec – Société et culture)	Canada	Established in 2011, FRQSC is a Quebec government funding agency that supports research in social sciences and humanities.
IACMI (Institute for Advanced Composites Manufacturing Innovation)	US	Established in 2015, IACMI is a US-based nonprofit organization and part of the Manufacturing USA network. Its main focus is on advancing the development and adoption of composite materials and manufacturing technologies.
IDRC (International Development Research Centre)	Canada	Established in 1970, IDRC is a Canadian federal Crown corporation that employs around 500 people. Its average annual budget is around CAD 200 million. IDRC's main focus is on supporting research projects that address global development challenges.
ITK (Inuit Tapiriit Kanatami)	Canada	Established in 1971, ITK is a national Inuit organization in Canada that represents over 50 Inuit communities across Canada. ITK's main focus is on advocating for Inuit rights and supporting Inuit-led research initiatives.
Library of Congress	US	Established in 1800, the Library of Congress is the US's oldest federal cultural institution and the largest library in the world. It employs around 3,100 people. The Library of Congress supports research in various fields through its vast collections and resources. Its average annual budget is around USD 700 million.
Mitacs	Canada	Established in 1999, Mitacs is a Canadian nonprofit organization that employs around 200 people. Its average annual budget is around CAD 100 million. Mitacs focuses on fostering collaborations between academia, industry, and government, providing research and training opportunities in various fields such as AI, health, and clean technology.
NAM (National Academy of Medicine)	US	Established in 1970, NAM is a US nonprofit organization that is part of the National Academies of Sciences, Engineering, and Medicine. NAM focuses on providing independent, objective advice on issues related to health, medicine, and biomedical science.



Organisation	Jurisdiction	Description
NASA (National Aeronautics and Space Administration)	US	Established in 1958, NASA is a US government agency that employs around 30,000 people. Its average annual budget is around USD 30 billion. NASA focuses on space research, exploration, and aeronautics technology.
National Research Council, Canada	Canada	Established in 1916, the National Research Council is a Canadian federal research organization that employs around 4,000 people. Its average annual budget is around CAD 1.4 billion to support research across various fields.
NEH (National Endowment for the Humanities)	US	Established in 1965, NEH is an independent US federal agency that employs around 150 people. Its average annual budget is around USD 250 million. NEH's main focus is on supporting research, education, and public programs in the humanities.
NIA (National Institute on Aging)	US	Established in 1974, NIA is a US government agency and part of the National Institutes of Health (NIH). NIA focuses on research related to aging, including biology, social and behavioral sciences, and public health.
NIFA (National Institute of Food and Agriculture)	US	Established in 2008, NIFA is a US government agency and part of the United States Department of Agriculture (USDA). NIFA focuses on supporting research, education, and extension activities related to agriculture, natural resources, and human sciences.
NIH (National Institutes of Health)	US	Established in 1887, NIH is a US government agency and part of the US Department of Health and Human Services. It employs around 20,000 people. NIH's average annual budget is around USD 45 billion. The main focus of its research is on biomedical and public health research.
NINDS (National Institute of Neurological Disorders and Stroke)	US	Established in 1950, NINDS is a US government agency and part of the National Institutes of Health (NIH). NINDS focuses on research related to neurological disorders and stroke, supporting basic, translational, and clinical research.
NIST (National Institute of Standards and Technology)	US	Established in 1901, NIST is a US government agency and part of the US Department of Commerce. It employs around 2,900 people. NIST's average annual budget is around USD 1 billion. The main focus of its research is on measurements, standards, and technology to promote innovation and industrial competitiveness.
NOAA (National Oceanic and Atmospheric Administration)	US	Established in 1970, NOAA is a US government agency and part of the US Department of Commerce. It employs around 12,000 people. NOAA's average annual budget is around USD 6.9 billion. The main focus of its research is on climate, weather, oceans, and coasts, as well as fisheries and marine ecosystems.
NREL (National Renewable Energy Laboratory)	US	Established in 1977, NREL is a US Department of Energy national laboratory that employs around 3,300 people. Its average annual budget is around USD 400 million. NREL focuses on research and development related to renewable energy and energy efficiency technologies.



Organisation	Jurisdiction	Description
NSERC (Natural Sciences and Engineering Research Council of Canada)	Canada	Established in 1978, NSERC is a Canadian federal funding agency that employs around 400 people. Its average annual budget is around CAD 1.2 billion. NSERC's main focus is on supporting research and training in natural sciences and engineering.
NSF (National Science Foundation)	US	Established in 1950, NSF is an independent US government agency that employs around 3,000 people. Its average annual budget is around USD 8 billion. NSF's main focus is on supporting research and education in all non-medical fields of science and engineering.
NYSERDA (New York State Energy Research and Development Authority)	US	Established in 1975, NYSERDA is a New York State public-benefit corporation that employs around 350 people. Its average annual budget is around USD 740 million. NYSERDA focuses on advancing energy efficiency, clean energy, and environmental research and development.
Ocean Technology Council of Nova Scotia, Canada	Canada	The Ocean Technology Council of Nova Scotia is a Canadian nonprofit organization that promotes the growth and development of the ocean technology sector in Nova Scotia.
PCI (Precast/Prestressed Concrete Institute)	US	Established in 1954, PCA is a US-based nonprofit organization that focuses on the research, design, construction, and maintenance of precast concrete structures.
Smithsonian Institution	US	Established in 1846, the Smithsonian is a US-based group of museums and research centers that employs around 6,300 people. Its average annual budget is around USD 1 billion. The Smithsonian supports research in various fields, including art, history, culture, and science.
SSHRC (Social Sciences and Humanities Research Council)	Canada	Established in 1977, SSHRC is a Canadian federal funding agency that employs around 200 people. Its average annual budget is around CAD 380 million. SSHRC's main focus is on supporting research and training in social sciences and humanities.
Stem Cell Network (SCN) in Canada	Canada	Established in 2001, SCN is a Canadian nonprofit organization that supports stem cell and regenerative medicine research, training, and knowledge translation.
SwRI (Southwest Research Institute)	US	Established in 1947, SwRI is a US-based independent nonprofit research and development organization that employs around 3,000 people. SwRI's main focus is on applied research and development in various fields, including automotive, defense, energy, and space.
USAID (US Agency for International Development)	US	Established in 1961, USAID is a US government agency that employs around 16,000 people. Its average annual budget is around USD 60 billion. USAID focuses on providing development assistance in various sectors, including health, education, and economic growth.
USDA (US Department of Agriculture)	US	Established in 1862, the USDA is a US government department that employs around 100,000 people. Its average annual budget is around USD 200 billion. The USDA supports research in various areas, including agriculture, food safety, natural resources, and rural development.

“ This report spends time with UKRI’s most trusted partners and – often in their own words – tells a story of an ever-strengthening relationship which contributes to UKRI’s aim to **Transform Tomorrow Together.**”





**UK Research
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North America
Amérique du Nord

UKRI brings together the seven disciplinary research councils, Research England, which is responsible for supporting research and knowledge exchange at higher education institutions in England, and the UK's innovation agency, Innovate UK.

The UK Research and Innovation (UKRI) North America office serves as UKRI's voice in the US and Canada. Our work fosters dialogue between funders and policy makers and leads to new partnerships between agencies, researchers and innovators in the UK and North America. The UKRI North America team is based in the British Embassy in Washington, DC and the British High Commission in Ottawa.

This report is intended to provide a comprehensive overview of the many activities undertaken between UKRI and our partners in the US and Canada. While every possible effort has been made to accurately reflect facts and figures on collaboration, we acknowledge that we have likely not captured all activity due to the extensive amount of collaboration.